EBERLINE
SERVICES

0060024

May 30, 2003

Mr. Steve Trent
Fluor Hanford Inc.
825 Jadwin Avenue
Richland, WA 99352

Reference: **P.O. #630**
Eberline Services R3-05-102-7518, SDG H2210

Dear Mr. Trent:

Enclosed is the data report for one other liquid sample designated under SAF No. F03-011 received at Eberline Services on May 16, 2003. The sample was analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

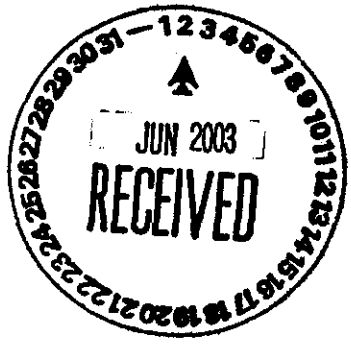
Sincerely,

Melissa Mannion

Melissa C. Mannion
Program Manager

MCM

Enclosure: Data Package



EDMC

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1.0 GENERAL

Fluor Hanford Inc. (FH) Sample Delivery Group H2210 was composed of one other liquid sample designated under SAF No. F03-011 with a Project Designations of: 200-PW-2/200-PW-4 OU – Other Liquid. The data is in units of picoCurie per milliliter (pCi/mL).

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

The LCS and method blank were not scaled to nominal aliquot. No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Melissa C. Mannion
Melissa C. Mannion
Program Manager

May 30, 2003
Date

E B E R L I N E S E R V I C E S / R I C H M O N D
SAMPLE DELIVERY GROUP H2210

SDG 7518
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H2210

S U M M A R Y D A T A S E C T I O N

T A B L E O F C O N T E N T S

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Melissa Mannion
Prepared by

Melissa Mannion
Reviewed by

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-TOC
Version 3.06
Report date 05/30/03

SDG 7518
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H2210

ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/30/03

SDG 7518
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG H2210

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/30/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2210

LAB SAMPLE SUMMARY

SDG 7518
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H2210

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
R305102-01	B17109	200-PW-2/200-PW-4 Reten.	LIQUID		F03-011	F03-011-001	05/13/03 10:00
R305102-02	Lab Control Sample		LIQUID		F03-011		
R305102-03	Method Blank		LIQUID		F03-011		
R305102-04	Duplicate (R305102-01)	200-PW-2/200-PW-4 Reten.	LIQUID		F03-011		05/13/03 10:00

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LS
Version 3.06
Report date 05/30/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2210

QC SUMMARY

SDG 7518
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H2210

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7518	F03-011-001	B17109	LIQUID		2.0 L		05/16/03	3	R305102-01	7518-001
		Method Blank	LIQUID						R305102-03	7518-003
		Lab Control Sample	LIQUID						R305102-02	7518-002
		Duplicate (R305102-01)	LIQUID		2.0 L		05/16/03	3	R305102-04	7518-004

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 05/30/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2210

PREP BATCH SUMMARY

SDG 7518
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H2210

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Gas Proportional Counting												
93A	LIQUID	Gross Alpha in Liquid	7060-203	20.0	1			1	1	1/1		
93B	LIQUID	Gross Beta in Liquid	7060-203	15.0	1			1	1	1/1		

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 05/30/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2210

LAB WORK SUMMARY

SDG 7518
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H2210

LAB SAMPLE / COLLECTED / RECEIVED	CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
R305102-01	B17109			7518-001	93A/93		05/23/03	05/30/03	MCM	Gross Alpha in Liquid
05/13/03	200-PW-2/200-PW-4 Reten.		LIQUID	7518-001	93B/93		05/23/03	05/30/03	MCM	Gross Beta in Liquid
05/16/03	F03-011-001	F03-011								
R305102-02	Lab Control Sample			7518-002	93A/93		05/27/03	05/30/03	MCM	Gross Alpha in Liquid
			LIQUID	7518-002	93B/93		05/24/03	05/30/03	MCM	Gross Beta in Liquid
		F03-011								
R305102-03	Method Blank			7518-003	93A/93		05/23/03	05/30/03	MCM	Gross Alpha in Liquid
			LIQUID	7518-003	93B/93		05/23/03	05/30/03	MCM	Gross Beta in Liquid
		F03-011								
R305102-04	Duplicate (R305102-01)			7518-004	93A/93		05/23/03	05/30/03	MCM	Gross Alpha in Liquid
05/13/03	200-PW-2/200-PW-4 Reten.		LIQUID	7518-004	93B/93		05/23/03	05/30/03	MCM	Gross Beta in Liquid
05/16/03		F03-011								

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
93A/93	F03-011	Gross Alpha in Liquid	900.0_ALPHABETA_GPC	1			1	1	1	4
93B/93	F03-011	Gross Beta in Liquid	900.0_ALPHABETA_GPC	1			1	1	1	4
TOTALS				2			2	2	2	8

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 05/30/03

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2210

7518-003 **Method Blank**

METHOD BLANK

SDG 7518	Client/Case no Hanford	SDG H2210
Contact Melissa C. Mannion	Contract No. 630	
Lab sample id R305102-03	Client sample id Method Blank	
Dept sample id 7518-003	Material/Matrix	LIQUID
	SAF No F03-011	

ANALYTE	CAS NO	RESULT pCi/mL	2σ ERR (COUNT)	MDA pCi/mL	RDL pCi/mL	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-0.060	0.082	0.23	0.010	U	93A
Gross Beta	12587-47-2	0.065	0.30	0.50	0.015	U	93B

200-PW-2/200-PW-4 OU - Other Liquid

QC-BLANK #44716

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/30/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2210

7518-002

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7518
Contact Melissa C. Mannion

Client/Case no Hanford SDG H2210
Contract No. 630

Lab sample id R305102-02
Dept sample id 7518-002

Client sample id Lab Control Sample
Material/Matrix LIQUID
SAF No F03-011

ANALYTE	RESULT pCi/mL	2σ ERR (COUNT)	MDA pCi/mL	RDL pCi/mL	QUALI-FIERS	TEST	ADDED pCi/mL	2σ ERR pCi/mL	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	18.5	1.4	0.25	0.010		93A	20.0	0.80	92	70-130	70-130
Gross Beta	21.4	1.1	0.53	0.015		93B	21.0	0.84	102	75-125	70-130

200-PW-2/200-PW-4 OU - Other Liquid

QC-LCS #44715

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 05/30/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2210

7518-004 B17109

DUPLICATE

SDG 7518 Client/Case no Hanford SDG H2210

Contact Melissa C. Mannion Contract No. 630

DUPLICATE	ORIGINAL	
Lab sample id R305102-04	Lab sample id R305102-01	Client sample id B17109
Dept sample id 7518-004	Dept sample id 7518-001	Location/Matrix 200-PW-2/200-PW-4 Reten. LIQUID
	Received 05/16/03	Collected/Volume 05/13/03 10:00 2.0 L
		Custody/SAF No F03-011-001 F03-011

ANALYTE	DUPLICATE pCi/mL	2σ ERR (COUNT)	MDA pCi/mL	RDL pCi/mL	QUALI-FIERS	TEST	ORIGINAL pCi/mL	2σ ERR (COUNT)	MDA pCi/mL	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Gross Alpha	0.001	0.001	0.001	0.010		93A	0.002	0.001	0.001		67	159
Gross Beta	0.015	0.002	0.002	0.015		93B	0.015	0.002	0.002		0	43

200-PW-2/200-PW-4 OU - Other Liquid

QC-DUP#1 44717

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 05/30/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2210

7518-001 B17109

DATA SHEET

SDG	7518	Client/Case no	Hanford SDG H2210
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R305102-01	Client sample id	B17109
Dept sample id	7518-001	Location/Matrix	200-PW-2/200-PW-4 Reten. LIQUID
Received	05/16/03	Collected/Volume	05/13/03 10:00 2.0 L
		Custody/SAF No	F03-011-001 F03-011

ANALYTE	CAS NO	RESULT pCi/mL	2σ ERR (COUNT)	MDA pCi/mL	RDL pCi/mL	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	0.002	0.001	0.001	0.010		93A
Gross Beta	12587-47-2	0.015	0.002	0.002	0.015		93B

200-PW-2/200-PW-4 OU - Other Liquid

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	05/30/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2210

Test 93A Matrix LIQUID
SDG 7518
Contact Melissa C. Mannion

LAB METHOD SUMMARY

GROSS ALPHA IN LIQUID
GAS PROPORTIONAL COUNTING

Client Hanford
Contract No. 630
Contract SDG H2210

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Gross Alpha
Preparation batch 7060-203					
R305102-01	93		7518-001	B17109	0.002
R305102-02	93		7518-002	LCS (QC ID=44715)	ok
R305102-03	93		7518-003	BLK (QC ID=44716)	U
R305102-04	93		7518-004	Duplicate (R305102-01)	ok
Nominal values and limits from method				RDLs (pCi/mL)	0.010
200-PW-2/200-PW-4 OU - Other Liquid					

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/mL	ALIQ mL	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7060-203			2σ prep error 20.0 % Reference Lab Notebook 7060 pg. 203													
R305102-01	93		B17109	0.001	300			32		100			10	05/22/03	05/23	GRB-105
R305102-02	93		LCS (QC ID=44715)	0.25	1.00			20		100				05/22/03	05/27	GRB-116
R305102-03	93		BLK (QC ID=44716)	0.23	1.00			20		100				05/22/03	05/23	GRB-101
R305102-04	93		Duplicate (R305102-01) (QC ID=44717)	0.001	300			32		100			10	05/22/03	05/23	GRB-102
Nominal values and limits from method				0.010	1.00			5-250		100			180			

PROCEDURES REFERENCE 900.0_ALPHABETA_GPC
CP-125 Gross Alpha and Beta in Dissolved Solids, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.12 ± 0.28
RESIDUE 26 ± 14

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 05/30/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2210

Test 93B Matrix LIQUID
SDG 7518
Contact Melissa C. Mannion

LAB METHOD SUMMARY

GROSS BETA IN LIQUID
GAS PROPORTIONAL COUNTING

Client Hanford
Contract No. 630
Contract SDG H2210

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Gross Beta
Preparation batch 7060-203					
R305102-01	93		7518-001	B17109	0.015
R305102-02	93		7518-002	LCS (QC ID=44715)	ok
R305102-03	93		7518-003	BLK (QC ID=44716)	0.065 U
R305102-04	93		7518-004	Duplicate (R305102-01)	ok
Nominal values and limits from method				RDLs (pCi/mL)	0.015
200-PW-2/200-PW-4 OU - Other Liquid					

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/mL	ALIQ mL	PREP FAC	DILU-TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7060-203			2σ prep error 15.0 %	Reference Lab Notebook 7060 pg. 203												
R305102-01	93		B17109	0.002	300			32		100			10	05/22/03	05/23	GRB-105
R305102-02	93		LCS (QC ID=44715)	0.53	1.00			20		100				05/22/03	05/24	GRB-102
R305102-03	93		BLK (QC ID=44716)	0.50	1.00			20		100				05/22/03	05/23	GRB-101
R305102-04	93		Duplicate (R305102-01) (QC ID=44717)	0.002	300			32		100			10	05/22/03	05/23	GRB-102
Nominal values and limits from method				0.015	1.00			5-250		100			180			

PROCEDURES REFERENCE 900.0_ALPHABETA_GPC
CP-125 Gross Alpha and Beta in Dissolved Solids, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.26 ± 0.59
RESIDUE 26 ± 14

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 05/30/03

SDG 7518
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H2210

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

* LAB SAMPLE ID is the lab's primary identification for a sample.

* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.

* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.

* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

  QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

* All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/30/03

SDG 7518
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H2210

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

* The preparation batches are shown in the same order as the Method Summary Reports are printed.

* Only analyses of planchets relevant to the SDG are included.

* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.

* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

  These qualifiers should be reviewed as follows:

  X Some data has been manually entered or modified. Transcription errors are possible.

  P One or more results are 'preliminary'. The data is not ready for final reporting.

  2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

  Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2210

SDG 7518
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H2210

WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.

* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.

* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.

* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.

* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
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Version 3.06
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SDG 7518
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H2210

DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.

* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

  The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

* ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.

* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.

* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).

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Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/30/03

DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.

B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.

H Similar to 'L' except the recovery was high.

P The RESULT is 'preliminary'.

X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.

2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

* An MDA is underlined if it is bigger than its RDL.

SDG 7518
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG_H2210

DATA SHEET

* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.

* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.

* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/30/03

SDG 7518
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H2210

LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.

* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

  An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The error of RESULT, including that introduced by rounding the result prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits for the recovery.

* The recovery is underlined if it is outside either of these ranges.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/30/03

SDG 7518
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H2210

DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

  If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

  For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

  If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

  This value reported for this limit is at most 999.

* The second limit for the RPD is the larger of:

  1. A fixed percentage specified in the protocol.

Lab id EBRLNE
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SDG 7518
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG_H2210

DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

* The RPD is underlined if it is greater than either limit.

* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

  Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

Lab id EBRLNE
Protocol Hanford
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Form DVD-RG
Version 3.06
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2210

SDG 7518
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H2210

MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

  An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The errors of the two RESULTs, including those introduced by rounding them prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/30/03

SDG 7518
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG H2210

MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/30/03

SDG 7518
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG_H2210

METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

  There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

  The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

  The J and X flags are as on the data sheet.

* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.

* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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Protocol Hanford
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Form DVD-RG
Version 3.06
Report date 05/30/03

METHOD SUMMARY

means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.

* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

  MDAs are underlined if greater than the printed RDL.

* Aliquots are underlined if less than the nominal value specified for the method.

* Prepareation factors are underlined if greater than the nominal value specified for the method.

* Dilution factors are underlined if greater than the nominal value specified for the method.

* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.

* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.

* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

SDG 7518
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG_H2210

METHOD SUMMARY

* Count times are underlined if less than the nominal value specified for the method.

* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.

* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.

* Days Held are underlined if greater than the holding time specified in the protocol.

* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1÷3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

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SDG 7518
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GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG_H2210

METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 05/30/03

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-011-001	Page 1 of 1
Collector Johansen/Pope/Pfister	Company Contact: Steve Trent; Telephone No.: 373-5869	Project Coordinator TRENT, SJ	Price Code 9C; Data Turnaround 15 Days
Project Designation 200-PW-2/200-PW-4 OU - Other Liquid	Sampling Location 200-PW-2/200-PW-4 Retention Basin H2210 (7318)	SAF No. F03-011	Air Quality ☐
Ice Chest No. ERC 01 011	Field Logbook No.: HNF-N-3361; COA: 117504ES10	Method of Shipment Federal Express	
Shipped To EBERLINE SERVICES (Formerly TMA)	Offsite Property No. A030259	Bill of Lading/Air Bill No. SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS
N/A

Special Handling and/or Storage
N/A

Preservation	None	None	None	None	
Type of Container	G	aG	P	G/P	
No. of Container(s)	1	1	1	2	
Volume	1000mL	250mL	125mL	1000mL	
SAMPLE ANALYSIS	See item (1) in Special Instructions.	TOC - 9060	pH (Soil) - 9045	Gross Alpha; Gross Beta	TIE TO:

(Columns 1–3 struck through: JS 5-12-03)

Sample No.	Matrix *	Sample Date	Sample Time								
B17109	OTHER LIQUID	5-13-03	1000				X			B17105	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[signature] FH	5/13/03 1130	SJGALE [signature] ERC	5/13/03 1130
SJGALE [signature] ERC	5/13/03 1130	REF #1A ERC	5/13/03 1130
REF 1A	51503 0900	SJGALE [signature]	51503 0900
SJGALE [signature]	51503 0900	FED EX	

SPECIAL INSTRUCTIONS
N/A
JS 5-12-03
~~(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Antimony, Beryllium, Bismuth, Boron, Copper, Nickel); Mercury - 7471 - (CV)~~

Personnel not available to relinquish samples from the 3728 Ref # 1A on 5/15/03

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

EBERLINE SERVICES

ANALYTICAL SERVICES GROUP
Richmond, CA Laboratory

SAMPLE RECEIPT CHECKLIST

Client: FLR Date/Time received 1000 5-16-03

CoC No. F03-011-001

Container I.D. No. ERC-01-011 Requested TAT (Days) 15 P.O. Received Yes [ ] No [ ]

INSPECTION

1.	Custody seals on shipping container intact?	Yes [✓]	No [ ]	N/A [ ]
2.	Custody seals on shipping container dated & signed?	Yes [✓]	No [ ]	N/A [ ]
3.	Custody seals on sample containers intact?	Yes [✓]	No [ ]	N/A [ ]
4.	Custody seals on sample containers dated & signed?	Yes [✓]	No [ ]	N/A [ ]
5.	Packing material is:	Wet [ ]	Dry [✓]	
6.	Number of samples in shipping container: 1			
7.	Number of containers per sample: 2 (Or see CoC ____)			
8.	Paperwork agrees with samples?	Yes [✓]	No [ ]	
9.	Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [✓]			
10.	Samples are: In good condition [✓] Leaking [ ] Broken Container [ ] Missing [ ]			
11.	*Samples are: Preserved [ ] Not preserved [✓] Preservative* ____			
12.	Describe any anomalies: ____			
13.	Was P.M. notified of any anomalies? Yes [ ] No [ ] Date ____			
14.	Received by [signature] Date: 5-16-03 Time: 1000			

Customer Sample No.	cpm	mR/hr	wipe	Customer Sample No.	cpm	mR/hr	wipe
B17109	240	.020					

Ion Chamber Ser. No. 4011 Calibration date 3-20-03

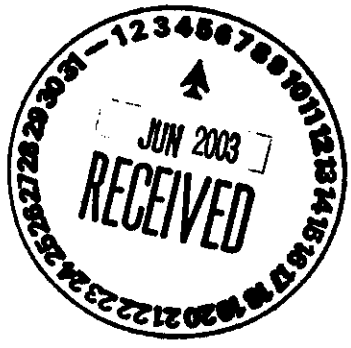
Alpha Meter Ser. No. ____ Calibration date ____

Beta/Gamma Meter Ser. No. 99579 Calibration date 12-12-02

LIONVILLE LABORATORY INC.

4 June 2003

Mr. Steve Trent
Fluor Hanford Inc.
825 Jadwin Ave.
Richland, WA 99352



Subject: Contract No. 630
Analytical Data Package

Dear Mr. Trent:

Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

LvLI Batch #	0305L430
SDG #	H2210
SAF #	F03-011
Date Received	5-16-03
# Samples	1
Matrix	Soil
Volatiles	
Semivolatiles	
Pest/PCB	
DRO/GRO/KRO	
Herbicides	
GC Alcohol	
Metals	X
Inorganics	X

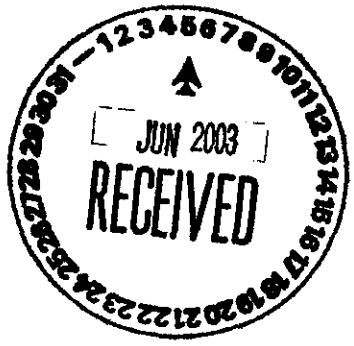
The electronic data deliverable (EDD) will be emailed shortly. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

Sincerely,
Lionville Laboratory Incorporated

Orlette S. Johnson
Project Manager

r:\group\pm\orlette\tnu-hanford\data\fc_ltrs.doc

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041



Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-011 H2210

DATE RECEIVED: 05/16/03 LVL LOT # :0305L430

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B17109						
SILVER, TOTAL	001	W	03L0287	05/13/03	05/23/03	05/30/03
SILVER, TOTAL	001 REP	W	03L0287	05/13/03	05/23/03	05/30/03
SILVER, TOTAL	001 MS	W	03L0287	05/13/03	05/23/03	05/30/03
ARSENIC, TOTAL	001	W	03L0287	05/13/03	05/23/03	05/30/03
ARSENIC, TOTAL	001 REP	W	03L0287	05/13/03	05/23/03	05/30/03
ARSENIC, TOTAL	001 MS	W	03L0287	05/13/03	05/23/03	05/30/03
BORON, TOTAL	001	W	03L0287	05/13/03	05/23/03	05/30/03
BORON, TOTAL	001 REP	W	03L0287	05/13/03	05/23/03	05/30/03
BORON, TOTAL	001 MS	W	03L0287	05/13/03	05/23/03	05/30/03
BARIUM, TOTAL	001	W	03L0287	05/13/03	05/23/03	05/30/03
BARIUM, TOTAL	001 REP	W	03L0287	05/13/03	05/23/03	05/30/03
BARIUM, TOTAL	001 MS	W	03L0287	05/13/03	05/23/03	05/30/03
BERYLLIUM, TOTAL	001	W	03L0287	05/13/03	05/23/03	05/30/03
BERYLLIUM, TOTAL	001 REP	W	03L0287	05/13/03	05/23/03	05/30/03
BERYLLIUM, TOTAL	001 MS	W	03L0287	05/13/03	05/23/03	05/30/03
BISMUTH, TOTAL	001	W	03L0287	05/13/03	05/23/03	05/30/03
BISMUTH, TOTAL REP	001 REP	W	03L0287	05/13/03	05/23/03	05/30/03
BISMUTH, TOTAL SPIKE	001 MS	W	03L0287	05/13/03	05/23/03	05/30/03
COPPER, TOTAL	001	W	03L0287	05/13/03	05/23/03	05/30/03
COPPER, TOTAL	001 REP	W	03L0287	05/13/03	05/23/03	05/30/03
COPPER, TOTAL	001 MS	W	03L0287	05/13/03	05/23/03	05/30/03
MERCURY, TOTAL	001	W	03C0124	05/13/03	05/21/03	05/22/03
MERCURY, TOTAL	001 REP	W	03C0124	05/13/03	05/21/03	05/22/03
MERCURY, TOTAL	001 MS	W	03C0124	05/13/03	05/21/03	05/22/03
NICKEL, TOTAL	001	W	03L0287	05/13/03	05/23/03	05/30/03
NICKEL, TOTAL	001 REP	W	03L0287	05/13/03	05/23/03	05/30/03
NICKEL, TOTAL	001 MS	W	03L0287	05/13/03	05/23/03	05/30/03
LEAD, TOTAL	001	W	03L0287	05/13/03	05/23/03	05/30/03
LEAD, TOTAL	001 REP	W	03L0287	05/13/03	05/23/03	05/30/03
LEAD, TOTAL	001 MS	W	03L0287	05/13/03	05/23/03	05/30/03
ANTIMONY, TOTAL	001	W	03L0287	05/13/03	05/23/03	05/30/03
ANTIMONY, TOTAL	001 REP	W	03L0287	05/13/03	05/23/03	05/30/03
ANTIMONY, TOTAL	001 MS	W	03L0287	05/13/03	05/23/03	05/30/03
SELENIUM, TOTAL	001	W	03L0287	05/13/03	05/23/03	05/30/03
SELENIUM, TOTAL	001 REP	W	03L0287	05/13/03	05/23/03	05/30/03

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-011 H2210

DATE RECEIVED: 05/16/03 LVL LOT # :0305L430

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
SELENIUM, TOTAL	001 MS	W	03L0287	05/13/03	05/23/03	05/30/03

LAB QC:

SILVER LABORATORY	LC1 BS	W	03L0287	N/A	05/23/03	05/30/03
SILVER, TOTAL	MB1	W	03L0287	N/A	05/23/03	05/30/03
ARSENIC LABORATORY	LC1 BS	W	03L0287	N/A	05/23/03	05/30/03
ARSENIC, TOTAL	MB1	W	03L0287	N/A	05/23/03	05/30/03
BORON LABORATORY	LC1 BS	W	03L0287	N/A	05/23/03	05/30/03
BORON, TOTAL	MB1	W	03L0287	N/A	05/23/03	05/30/03
BARIUM LABORATORY	LC1 BS	W	03L0287	N/A	05/23/03	05/30/03
BARIUM, TOTAL	MB1	W	03L0287	N/A	05/23/03	05/30/03
BERYLLIUM LABORATORY	LC1 BS	W	03L0287	N/A	05/23/03	05/30/03
BERYLLIUM, TOTAL	MB1	W	03L0287	N/A	05/23/03	05/30/03
BISMUTH, LCS	LC1 BS	W	03L0287	N/A	05/23/03	05/30/03
BISMUTH, TOTAL	MB1	W	03L0287	N/A	05/23/03	05/30/03
COPPER LABORATORY	LC1 BS	W	03L0287	N/A	05/23/03	05/30/03
COPPER, TOTAL	MB1	W	03L0287	N/A	05/23/03	05/30/03
MERCURY LABORATORY	LC1 BS	W	03C0124	N/A	05/21/03	05/22/03
MERCURY, TOTAL	MB1	W	03C0124	N/A	05/21/03	05/22/03
MERCURY, TCLP LEACHA	MB2	W	03C0124	N/A	05/21/03	05/22/03
MERCURY, TCLP LEACHA	MB3	W	03C0124	N/A	05/21/03	05/22/03
NICKEL LABORATORY	LC1 BS	W	03L0287	N/A	05/23/03	05/30/03
NICKEL, TOTAL	MB1	W	03L0287	N/A	05/23/03	05/30/03
LEAD LABORATORY	LC1 BS	W	03L0287	N/A	05/23/03	05/30/03
LEAD, TOTAL	MB1	W	03L0287	N/A	05/23/03	05/30/03
ANTIMONY LABORATORY	LC1 BS	W	03L0287	N/A	05/23/03	05/30/03
ANTIMONY, TOTAL	MB1	W	03L0287	N/A	05/23/03	05/30/03
SELENIUM LABORATORY	LC1 BS	W	03L0287	N/A	05/23/03	05/30/03
SELENIUM, TOTAL	MB1	W	03L0287	N/A	05/23/03	05/30/03

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD F03-011
LVL#: 0305L430
SDG/SAF#: H2210/F03-011

W.O.#: 11343-606-001-9999-00
Date Received: 05-16-01

METALS CASE NARRATIVE

1. This narrative covers the analysis of 1 water sample.

2. The sample was prepared and analyzed in accordance with methods checked on the attached glossary.

3. All analyses were performed within the required holding times.

4. Please refer to the Sample Receipt Check List for sample discrepancies in LvLI's sample acceptance policy.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.

11. The duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

12. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

13. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

06-04-03
Date

gmb/m05-430

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Lot#: 0305L430

Leaching Procedure: __1310 __1311 __1312 __Other:_____

CLP Metals __ Digestion and /__ Analysis Methods: __ILM03.0 __ILM04.0

Metals Digestion Methods: √__3005A __3010A __3015 __3020A __3050B __3051 __200.7 __SS17
__Other: _____

Metals Analysis Methods

	SW846	EPA	STD MTD	EPA OSWR	USATHAMA
Aluminum	__6010B	__200.7			__99
Antimony	__6010B __7041 [5]	__200.7 __204.2			__99
Arsenic	__6010B __7060A [5]	__200.7 __206.2	__3113B		__99
Barium	__6010B	__200.7			__99
Beryllium	__6010B	__200.7			__99
Bismuth	__6010B [1]	__200.7 [1]		__1620	__99
Boron	__6010B	__200.7			__99
Cadmium	__6010B __7131A [5]	__200.7 __213.2			__99
Calcium	__6010B	__200.7			__99
Chromium	__6010B __7191 [5]	__200.7 __218.2			__SS17
Cobalt	__6010B	__200.7			__99
Copper	__6010B __7211 [5]	__200.7 __220.2			__99
Iron	__6010B	__200.7			__99
Lead	__6010B __7421 [5]	__200.7 __239.2	__3113B		__99
Lithium	__6010B __7430 [4]	__200.7		__1620	__99
Magnesium	__6010B	__200.7			__99
Manganese	__6010B	__200.7			__99
Mercury	__7470A [3] __7471A [3]	__245.1 [2] __245.5 [2]			__99
Molybdenum	__6010B	__200.7			__99
Nickel	__6010B	__200.7			__99
Potassium	__6010B __7610 [4]	__200.7 __258.1 [4]			__99
Rare Earths	__6010B [1]	__200.7 [1]		__1620	__99
Selenium	__6010B __7740 [5]	__200.7 __270.2	__3113B		__99
Silicon	__6010B [1]	__200.7		__1620	__99
Silica	__6010B	__200.7		__1620	__99
Silver	__6010B __7761 [5]	__200.7 __272.2			__99
Sodium	__6010B __7770 [4]	__200.7 __273.1 [4]			__99
Strontium	__6010B	__200.7			__99
Thallium	__6010B __7841 [5]	__200.7 __279.2 __200.9			__99
Tin	__6010B	__200.7			__99
Titanium	__6010B	__200.7			__99
Uranium	__6010B [1]	__200.7 [1]		__1620	__99
Vanadium	__6010B	__200.7			__99
Zinc	__6010B	__200.7			__99
Zirconium	__6010B [1]	__200.7 [1]		__1620	__99

Other:_____ Method:_____

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LCS = Laboratory Control Sample.
NC = Not calculated.

ANALYTICAL METAL METHODS

1. Not included in the method element list.

2. Modified Hg: Hg1 and Hg2 require less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionately scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 mL. For soils, approximately 0.3 grams of sample is taken to a final volume of 50 mL (including all reagents).

3. Flame AA.

4. Graphite Furnace AA.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 06/02/03

CLIENT: TNUHANFORD F03-011 H2210 LVL LOT #: 0305L430

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B17109	Silver, Total	1.2	u	UG/L	1.2	1.0
		Arsenic, Total	6.5		UG/L	3.3	1.0
		Boron, Total	102		UG/L	1.9	1.0
		Barium, Total	58.3		UG/L	0.20	1.0
		Beryllium, Total	0.10		UG/L	0.10	1.0
		Bismuth, Total	5.1	u	UG/L	5.1	1.0
		Copper, Total	6.2		UG/L	0.60	1.0
		Mercury, Total	0.10	u	UG/L	0.10	1.0
		Nickel, Total	2.4		UG/L	1.3	1.0
		Lead, Total	2.3	u	UG/L	2.3	1.0
		Antimony, Total	2.2	u	UG/L	2.2	1.0
		Selenium, Total	4.2	u	UG/L	4.2	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 06/02/03

CLIENT: TNUHANFORD F03-011 H2210 LVL LOT #: 0305L430

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	03L0287-MB1	Silver, Total	1.2	u	UG/L	1.2	1.0
		Arsenic, Total	3.3	u	UG/L	3.3	1.0
		Boron, Total	1.9	u	UG/L	1.9	1.0
		Barium, Total	0.25		UG/L	0.20	1.0
		Beryllium, Total	0.10	u	UG/L	0.10	1.0
		Bismuth, Total	5.1	u	UG/L	5.1	1.0
		Copper, Total	0.60	u	UG/L	0.60	1.0
		Nickel, Total	1.3	u	UG/L	1.3	1.0
		Lead, Total	2.3	u	UG/L	2.3	1.0
		Antimony, Total	2.2	u	UG/L	2.2	1.0
		Selenium, Total	4.2	u	UG/L	4.2	1.0
BLANK1	03C0124-MB1	Mercury, Total	0.10	u	UG/L	0.10	1.0
BLANK2	03C0124-MB2	Mercury, TCLP Leachate	0.10	u	UG/L	0.10	1.0
BLANK3	03C0124-MB3	Mercury, TCLP Leachate	0.10	u	UG/L	0.10	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 06/02/03

CLIENT: TNUHANFORD F03-011 H2210 LVL LOT #: 0305L430

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B17109	Silver, Total	49.5	1.2 u	50.0	99.0	1.0
		Arsenic, Total	1960	6.5	2000	97.7	1.0
		Boron, Total	1090	102	1000	98.6	1.0
		Barium, Total	2030	58.3	2000	98.6	1.0
		Beryllium, Total	48.3	0.10	50.0	96.4	1.0
		Bismuth, Total	4950	5.1 u	5000	98.9	1.0
		Copper, Total	258	6.2	250	100.9	1.0
		Mercury, Total	1.0	0.10u	1.0	99.7	1.0
		Nickel, Total	492	2.4	500	97.9	1.0
		Lead, Total	494	2.3 u	500	98.8	1.0
		Antimony, Total	490	2.2 u	500	98.0	1.0
		Selenium, Total	1980	4.2 u	2000	98.9	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 06/02/03

CLIENT: TNUHANFORD F03-011 H2210 LVL LOT #: 0305L430

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B17109	Silver, Total	1.2 u	1.2 u	NC	1.0
		Arsenic, Total	6.5	5.2	22.2	1.0
		Boron, Total	102	99.4	2.8	1.0
		Barium, Total	58.3	58.3	0.00	1.0
		Beryllium, Total	0.10	0.11	9.5	1.0
		Bismuth, Total	5.1 u	5.1 u	NC	1.0
		Copper, Total	6.2	6.2	0.00	1.0
		Mercury, Total	0.10u	0.10u	NC	1.0
		Nickel, Total	2.4	1.3	59.5	1.0
		Lead, Total	2.3 u	2.3 u	NC	1.0
		Antimony, Total	2.2 u	2.2 u	NC	1.0
		Selenium, Total	4.2 u	4.2 u	NC	1.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 06/02/03

CLIENT: TNUHANFORD F03-011 H2210 LVL LOT #: 0305L430

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	03L0287-LC1	Silver, LCS	496	500	UG/L	99.3
		Arsenic, LCS	9710	10000	UG/L	97.1
		Boron, LCS	4860	5000	UG/L	97.3
		Barium, LCS	4890	5000	UG/L	97.8
		Beryllium, LCS	240	250	UG/L	96.0
		Bismuth, LCS	4960	5000	UG/L	99.1
		Copper, LCS	1240	1250	UG/L	99.1
		Nickel, LCS	1960	2000	UG/L	97.9
		Lead, LCS	2440	2500	UG/L	97.5
		Antimony, LCS	2970	3000	UG/L	98.9
		Selenium, LCS	9950	10000	UG/L	99.5
LCS1	03C0124-LC1	Mercury, LCS	5.3	5.0	UG/L	105.5

Lionville Laboratory Use Only

03056430

Custody Transfer Record/Lab Work Request

LVLI — LIONVILLE LABORATORY INC

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client [illegible] F03-011
Est. Final Proj. Sampling Date
Project # [illegible] 600 001-9999-00
Project Contact/Phone # [illegible]
Lionville Laboratory Project Manager [illegible]
QC Spec Del 5-[illegible] TAT 15 days

Date Rec'd 5-16-03 Date Due 5-31-03

	A		B	C
Refrigerator #	2		2	1
#/Type Container — Liquid	1AG		1PC	1AG
#/Type Container — Solid				
Volume — Liquid	1L		125	250
Volume — Solid				
Preservatives	–		–	–
ANALYSES REQUESTED →	INORG: ICP Metal	INORG: CN	pH	TOC
Lionville Laboratory Use Only	MET ①		I PH	I OCT

ORGANIC: VOA, BNA, Pest/PCB, Herb

MATRIX CODES: S - Soil, SE - Sediment, SO - Solid, SL - Sludge, W - Water, O - Oil, A - Air, DS - Drum Solids, DL - Drum Liquids, L - EP/TCLP Leachate, WI - Wipe, X - Other, F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	MET ①	I PH	I OCT
001	B17709	X	X	W	5-13-03	1000	1	1	1

Special Instructions: SAF # F03-011

MET ①: As, Ba, Pb, Se, Ag, Sb, Be, Bi, B, Cu, Ni, Hg

Analyze Unpreserved - per Client

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered ___
Airbill # See Below
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times ~~Y~~ or (N)

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 2.2 °C

Relinquished by	Received by	Date	Time
FEDEX	Cal [illegible]	5-16-03	0935

Relinquished by	Received by	Date	Time
COMPOSITE WASTE	ORIGINAL REWRITTEN		

Discrepancies Between Samples Labels and COC Record? Y or (N)
NOTES:
7915 8311 5170

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-011-001	Page 1 of 1

Collector	Company Contact / Telephone No.	Project Coordinator	Price Code / Data Turnaround
Johansen/Pope/Pfister	Steve Trent 373-5869	TRENT, SJ	9C / 15 Days
Project Designation	**Sampling Location**	**SAF No.**	**Air Quality** ☐
200-PW-2/200-PW-4 OU - Other Liquid	200-PW-2/200-PW-4 Retention Basin	F03-011	
Ice Chest No. ERC 02 406	**Field Logbook No.** HNF-N-3361 / **COA** 117504ES10	**Method of Shipment** Federal Express	
Shipped To ~~EBERLINE SERVICES (Formerly TMA)~~ RECRA 5-12-03	**Offsite Property No.** A030230	**Bill of Lading/Air Bill No.** SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS
N/A

Special Handling and/or Storage
N/A

Preservation	None	None	None	None							
Type of Container	G	aG	P	G/P							
No. of Container(s)	1	1	1	2							
Volume	1000mL	250mL	125mL	1000mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	TOC - 9060	pH (Soil) - 9045	Gross Alpha; Gross Beta 1A (5-12-03)				TIC TO:			

Sample No.	Matrix *	Sample Date	Sample Time										
B17109	OTHER LIQUID	5-13-03	1000	X	X	X					B17105		

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible] FH	5/13/03 1130	S Johnson ERC	5/13/03 1130
S Johnson ERC	5/13/03 1130	REF #1A ERC	5/13/03 1130
REF 1A 51503	0900	S Johnson 51503	0900
S Johnson 51503	0900	FED EX	
FED EX	5-16-03 0935	Carl Hy	5-16-03 0935
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS
N/A

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Antimony, Beryllium, Bismuth, Boron, Copper, Nickel}; Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref # 1A on 5/15/03

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

IENT: TNU HANFORD

chase Order/Project:

DATE: 5-16-03

#/ SOW# / Release #: F03-011

oratory SDG #: 0305L430

TE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1.	Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2.	Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3.	Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5.	Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6.	Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7.	All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8.	All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10.	Shipment meets LvL1 Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☑ Yes	☑ No	☐ N/A	☐ see Comment # ①
11.	Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12.	coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13.	coc will be faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☑ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

RC 02 406 22°

① Received pH Out of Hold

Laboratory Sample Custodian: Carl Hung

Laboratory Project Manager:

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-011 H2210

DATE RECEIVED: 05/16/03 LVL LOT # :0305L430

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS	ANALYSIS TIME
B17109							
TOTAL ORGANIC CARBON	001	W	03LTC019	05/13/03	05/28/03	05/28/03	
TOTAL ORGANIC CARBON	001 REP	W	03LTC019	05/13/03	05/28/03	05/28/03	
TOTAL ORGANIC CARBON	001 MS	W	03LTC019	05/13/03	05/28/03	05/28/03	
PH	001	W	03LPH036	05/13/03	05/21/03	05/21/03	1410
LAB QC:							
TOTAL ORGANIC CARBON	MB1	W	03LTC019	N/A	05/28/03	05/28/03	
TOTAL ORGANIC CARBON	MB1 BS	W	03LTC019	N/A	05/28/03	05/28/03	

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD F03-011 H2210
LVL#: 0305L430

W.O.#: 11343-606-001-9999-00
Date Received: 05-16-03

INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 water sample.

2. The sample was prepared and analyzed in accordance with the methods checked on the attached glossary.

3. Sample holding time as required by the method and/or contract was met for Total Organic Carbon (TOC) however pH was received past hold (see the sample chronology summary for analysis time for short hold sample).

4. The results presented in this report are derived from samples that did not meet LvLI's sample acceptance policy as noted on the Sample Receipt Checklist.

5. The method blank for TOC was within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits.

7. The matrix spike recovery for TOC was within the 75-125% control limits.

8. The replicate analysis for TOC was within the 20% Relative Percent Difference (RPD) control limit.

9. Replicate analysis for pH was inadvertently omitted.

10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

06-03-03
Date

njp\i05-430

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3041

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR WATER SAMPLE ANALYSIS

	EPA /600	SW846	OTHER
Acidity	___ 305.1		
___Alkalinity ___Bicarbonate ___Carbonate	___ 310.1		
BOD	___ 405.1		___ 5210B (b)
Ion Chromatography:			
___Bromide ___Chloride ___Fluoride	___ 300.0	___ 9056	
___Nitrate ___Nitrite ___Phosphate	___ 300.0	___ 9056	
___Sulfate ___Formate ___Acetate ___Oxalate	___ 300.0	___ 9056	
Chloride	___ 325.2	___ 9251	
Chorine, Residual	___ 330.5 (mod)		
Cyanide, Amenable to Chlorination	___ 335.2	___ 9010B	
Cyanide, Total	___ 335.2	___ 9010B ___ 9014	___ ILMO4.0 (e)
Cyanide, Weak Acid Dissociable		___	___ 412 (a) ___ 4500CN-I (b)
COD	___ 410.4(mod)		___ 5220C (b)
Color	___ 110.2		
Corrosivity by Coupon		___ 1110(mod)	
Chromium VI		___ 7196A	___ 3500Cr-D (b)
Fluoride	___ 340.2		___ 4500-FC
Hardness, Calcium	___ 215.2		
Hardness, Total	___ 130.2		
Iodide			___ ASTM D19P202 (1)
Surfactant	___ 425.1		
___Nitrate-Nitrite ___Nitrate ___Nitrite	___ 353.2		
Ammonia	___ 350.3		
Total ___Kjeldahl ___ Organic Nitrogen	___ 351.3		
Total ✓ Organic ___ Inorganic Carbon	___ 415.1	✓ 9060	
Oil & Grease	___ 413.1	___ 9070	
✓ pH ___ pH; paper	___ 150.1	✓ 9040B ___ 9041A	
Petroleum Hydrocarbons, Total Recoverable	___ 418.1		
Phenol	___ 420.1 ___ 420.2	___ 9065 ___ 9066	
___Ortho ___Total Phosphate	___ 365.2		___ 4500-P B ___ C
Salinity			___ 210A (a) ___ 2520 (b)
Settleable Solids	___ 160.5		
Sulfide	___ 376.1	___ 9030B/9034 (acid soluble)	
Reactive ___Cyanide ___Sulfide		___ Section 7.3 (___9014 ___9030B)	
Silica	___ 370.1		
Sulfite	___ 377.1		
Sulfate	___ 375.4	___ 9038	
Specific Conductance	___ 120.1	___ 9050A	
Specific Gravity			___ D5057-90 ___ 213E (a)
Synthetic Precipitation Leach	___ 1312		
Total ___Dissolved ___Suspended ___Solids	160 ___.1 ___.2 ___.3		
Total Organic Halides	___ 450.1	___ 9020B	
Turbidity	___ 180.1		
Volatile Solids:			
___Total ___Dissolved ___Suspended	___ 160.4		
Other:		**Method:**	

Lionville Laboratory Incorporated

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LC = Laboratory Control Sample.
NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).

3. Test Methods for Evaluating Solid Waste (USEPA SW-846).

a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).

b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).

c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).

d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 05/30/03

CLIENT: TNUHANFORD F03-011 H2210 LVL LOT #: 0305L430
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B17109	Total Organic Carbon	18.9	MG/L	1.0	2.0
		pH	7.7	PH UNIT	0.01	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/30/03

CLIENT: TNUHANFORD F03-011 H2210 LVL LOT #: 0305L430
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	03LTC019-MB1	Total Organic Carbon	0.50 u	MG/L	0.50	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 05/30/03

CLIENT: TNUHANFORD F03-011 H2210 LVL LOT #: 0305L430

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B17109	Total Organic Carbon	30.2	18.9	10.0	112.8	2.0
BLANK10	03LTC019-MB1	Total Organic Carbon	4.9	0.50u	5.0	97.4	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 05/30/03

CLIENT: TNUHANFORD F03-011 H2210 LVL LOT #: 0305L430

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B17109	Total Organic Carbon	18.9	19.4	2.8	2.0

Lionville Laboratory Use Only

03O5C430

Custody Transfer Record/Lab Work Request

Page 1 of 1

LvLI LIONVILLE LABORATORY INC

09

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client [illegible] F03-011

Est. Final Proj. Sampling Date

Project # [illegible] 001 [illegible] 00

Project Contact/Phone #

Lionville Laboratory Project Manager BJ

QC Spec Del 5-CD TAT 15 days

Date Rec'd 5-16-03 Date Due 5-31-03

	A	B	C
Refrigerator #	2	2	1
#/Type Container – Liquid	1AG	1PL	1AG
#/Type Container – Solid			
Volume – Liquid	1L	125	250
Volume – Solid			
Preservatives	–	–	–
ANALYSES REQUESTED	INORG: ICP Metal	pH	TOC
Lionville Laboratory Use Only	MET ①	IPH	IOCT

ANALYSES REQUESTED: ORGANIC (VOA, BNA, Pest/PCB, Herb); INORG (ICP Metal, CN); pH; TOC

MATRIX CODES: S - Soil; SE - Sediment; SO - Solid; SL - Sludge; W - Water; O - Oil; A - Air; DS - Drum Solids; DL - Drum Liquids; L - EP/TCLP Leachate; WI - Wipe; X - Other; F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	MET ①	IPH	IOCT
001	B17709	X	X	W	5-13-03	1000	1	1	1

Special Instructions: SAF # F03-011

MET ①: As, Ba, Pb, Se, Ag, Sb, Be, Bi, B, Cu, Ni, Hg

Analyze Unpreserved – per Client

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

Lionville Laboratory Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # see below
2) Ambient or (Chilled)
3) Received in Good Condition (Y) or N
4) Samples Properly Preserved (Y) or N
5) Received Within Holding Times ~~(Y)~~ or (N) pH

Tamper Resistant Seal was:
1) Present on Outer Package (Y) or N
2) Unbroken on Outer Package (Y) or N
3) Present on Sample (Y) or N
4) Unbroken on Sample (Y) or N
COC Record Present Upon Sample Rec't (Y) or N
Cooler Temp. 2.2 °C

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
FEDEX	Cal [illegible]	5-16-03	0935				

COMPOSITE WASTE

ORIGINAL REWRITTEN

Discrepancies Between Samples Labels and COC Record? Y or (N)

NOTES: 791593665178

FH-Central Plateau Project	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F03-011-001	Page 1 of 1
Collector Johansen/Pope/Pfister	Company Contact Steve Trent	Telephone No. 373-5869	Project Coordinator TRENT, SJ	Price Code 9C Air Quality ☐
Project Designation 200-PW-2/200-PW-4 OU - Other Liquid	Sampling Location 200-PW-2/200-PW-4 Retention Basin		SAF No. F03-011	Data Turnaround 15 Days
Ice Chest No. ERC 02 406	Field Logbook No. HNF-N-3361	COA 117504ES10	Method of Shipment Federal Express	
Shipped To ~~EBERLINE SERVICES (Formerly TMA)~~ RECRA 5-12-03	Offsite Property No. A030230		Bill of Lading/Air Bill No. SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS												
N/A	Preservation	None	None	None	None							
Special Handling and/or Storage	Type of Container	G	aG	P	G/P							
N/A	No. of Container(s)	1	1	1	2							
	Volume	1000mL	250mL	125mL	1000mL							
SAMPLE ANALYSIS		See item (1) in Special Instructions.	TOC - 9060	pH (Soil) - 9045	Gross Alpha; Gross Beta 1A 5-12-03			TIJO:				
Sample No.	Matrix *	Sample Date	Sample Time									
B17109	OTHER LIQUID	5-13-03	1000	X	X	X				B17105		

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From FH Date/Time 5/13/03 1130	Received By/Stored In ERC Date/Time 5/13/03 1130
Relinquished By/Removed From ERC Date/Time 5/13/03 1130	Received By/Stored In ERC Date/Time 5/13/03 1130
Relinquished By/Removed From REF 1A 51503 Date/Time 0900	Received By/Stored In SJGALE Date/Time 51503 0900
Relinquished By/Removed From Date/Time 51503 0900	Received By/Stored In FED EX Date/Time
Relinquished By/Removed From FEDEX 5-16-03 Date/Time 0935	Received By/Stored In Date/Time 5-16-03 0735
Relinquished By/Removed From Date/Time	Received By/Stored In Date/Time

SPECIAL INSTRUCTIONS

N/A

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Lead, Selenium, Silver}; ICP Metals - 6010A (Supertrace Add-On) {Antimony, Beryllium, Bismuth, Boron, Copper, Nickel}; Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref # 1A on 5/15/03

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

LIONVILLE LABORATORY INCORPORATED
SAMPLE RECEIPT CHECKLIST

CLIENT: TNU HANFORD

Purchase Order/Project:

DATE: 5-16-03

SDF / SOW# / Release #: F03-011

Laboratory SDG #: 0305L430

NOTE: ALL ENTRIES MARKED "NO" MUST BE EXPLAINED IN THE COMMENT SECTION

1.	Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
2.	Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
3.	Airbill # recorded?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
4.	All expected paperwork received (coc and other client specific: historical data, alpha/beta or other screening data as applicable)? (paperwork sealed in plastic bag and taped to inside lid)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
5.	Sample containers are intact?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
6.	Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
7.	All samples on coc received?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
8.	All sample label information matches coc?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
9.	Laboratory QC samples designated on coc? (QC stickers placed on bottles?)	☑ Yes	☐ No	☐ N/A	☐ see Comment #
10.	Shipment meets LvLI Sample Acceptance Policy? (identify all bottles not within policy. See reverse side for policy)	☑ Yes	☑ No	☐ N/A	☐ see Comment # ①
11.	Where applicable, bar code labels are affixed to coc?	☐ Yes	☐ No	☑ N/A	☐ see Comment #
12.	coc signed and dated?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
13.	coc will be faxed or emailed to client?	☑ Yes	☐ No	☐ N/A	☐ see Comment #
14.	Project Manager/Client contacted concerning discrepancies? (name/date)	☐ Yes	☐ No	☑ N/A	☐ see Comment #

Cooler # / temp (°C) and Comments:

IRC 02 406 2.2°

① Received pH Out of Hold

Laboratory Sample Custodian: Carl Hung

Laboratory Project Manager: